

What is claimed is:

1. A method for estimating the position of a receiver
5 receiving code modulated signals from at least one
beacon, said method comprising:
delimiting a region containing said receiver
position based on a code modulated signal received at
said receiver from at least one beacon and on available
10 information including at least an initial information
on said receiver position; and
estimating said receiver position as a position
within said delimited region which minimizes an error
criterion.
15
2. The method according to claim 1, wherein said error
criterion is at least one of a mean square error of a
position within said delimited region, a mean absolute
error of a position within said delimited region and a
20 maximum error of a position within said delimited
region.
3. The method according to claim 1, wherein said error
criterion takes into account a probability density
25 function indicating the probability density for
positions in said delimited region to correspond to
said receiver position.
4. The method according to claim 1, wherein estimating
30 said receiver position comprises covering said
delimited region with a grid comprising a plurality of
grid points, and determining the receiver position as
one of said grid points which minimizes among at least
selected ones of said grid points said error criterion.
35

5. The method according to claim 4, further comprising:
calculating an assumed time of arrival of code
modulated signals from at least two beacons at each of
said grid points based on the time of transmission of
said code modulated signals and the time of flight of
said code modulated signals to said grid points;
comparing the differences between said calculated
times of arrival with a threshold value; and
excluding those grid points for which said
differences exceed said threshold value before
determining said grid point which minimizes among
remaining grid points said error criterion.
6. The method according to claim 4, further comprising
excluding certain grid points based on known conditions
before determining said grid point which minimizes
among remaining grid points said error criterion.
7. The method according to claim 1, comprising, in case a
time available at said receiver is not accurate but a
maximum deviation of said available time from an
accurate time is known, determining sub-regions based
on a code modulated signal received from at least one
beacon of said available time for different possible
times within said maximum deviation, and delimiting
said region containing said receiver position based on
a combination of said sub-regions and on available
information including at least an initial information
on said receiver position.
8. A receiver comprising for an estimation of the position
of said receiver:
a receiving portion for receiving a code modulated
signal from beacons; and

5 a processing portion for delimiting a region
containing said receiver position based on a code
modulated signal received by said receiving portion
from at least one beacon and on available information
including at least an initial information on said
receiver position, and for estimating said receiver
position as a position within said delimited region
which minimizes an error criterion.

10 9. A system for estimating the position of a receiver
receiving code modulated signals from at least one
beacon, said system comprising:

15 said receiver, which includes a receiving portion
for receiving code modulated signals from beacons; and
a device with a processing portion for delimiting a
region containing said receiver position based on a
code modulated signal received by said receiving
portion from at least one beacon and on available
information including at least an initial information
20 on said receiver position, and for estimating said
receiver position as a position within said delimited
region which minimizes an error criterion.

25 10. The system according to claim 9, wherein said device is
combined with said receiver.

30 11. The system according to claim 10, further comprising a
mobile communication network, wherein said device is a
mobile terminal adapted to communicate with said mobile
communication network.

12. The system according to claim 9, wherein said receiver
is combined with a mobile terminal and wherein said
device is a network element of a mobile communication

network, said mobile terminal being adapted to
communicate with said mobile communication network.

13. A software program product in which a software code for
5 estimating the position of a receiver receiving code
modulated signals from at least one beacon is stored,
said software code realizing the following steps when
running in a processing unit:
- 10 delimiting a region containing said receiver
position based on a code modulated signal received at
said receiver from at least one beacon and on available
information including at least an initial information
on said receiver position; and
- 15 estimating said receiver position as a position
within said delimited region which minimizes an error
criterion.